

MANIPAL UNIVERSITY
FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – MAY/JUNE 2013
SUBJECT: ANATOMY

Tuesday, May 28, 2013

Time: 10.00-11.30 Hrs.

Max. Marks: 40

✍ **Answer ALL the questions.**

1. Describe the lobes and functional areas of cerebral hemisphere.

(2+6 = 8 marks)

2. Describe the position, lobes, surfaces, relations, blood supply and nerve supply of liver.

(1+2+1+2+1+1 = 8 marks)

3. **Write briefly on:**

3A. Ureter

3B. Spermatic cord

3C. Breast

3D. Cartilage

3E. Thoraco-abdominal diaphragm

3F. Retina

3G. Superior vena cava

3H. Pituitary gland

(3×8 = 24 marks)



MANIPAL UNIVERSITY

FIRST YEAR B.Sc. NMT DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: PHYSIOLOGY

Thursday, May 30, 2013

Time: 10.00-11.30 Hours.

Max. Marks: 40

✍ **Answer ALL questions. Draw diagrams wherever necessary.**

1. Essay questions:

- 1A. Classify leucocytes. Mention one function of each.
- 1B. Draw a neat labeled diagram of the visual pathway.
- 1C. Mention the site of formation and circulation of cerebrospinal fluid. List any two functions of cerebrospinal fluid.
- 1D. List five actions of cortisol.

(5×4 = 20 marks)

2. Write short answers for the following:

- 2A. Mention any two transport mechanisms across the cell membrane.
- 2B. Mention any two differences between the first and second heart sounds.
- 2C. Enumerate any two differences between skeletal and smooth muscles.
- 2D. Mention any two anticoagulants.
- 2E. Define stroke volume. Give its normal value.
- 2F. Mention the different forms in which oxygen is transported in the blood.
- 2G. List any two functions of liver.
- 2H. Define alveolar ventilation. Mention its normal value.
- 2I. List any two functions of placenta.
- 2J. Define renal threshold. Mention the renal threshold for glucose.

(2×10 = 20 marks)



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FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: BIOCHEMISTRY

Saturday, June 01, 2013

Time: 10.00-11.30 Hours

Max. Marks: 40

1. Write in detail the reactions of urea cycle. Add a note on two disorders of urea cycle.
(8 marks)
2. Explain the metabolism of ketone bodies.
(6 marks)
3. **Write short notes on the following:**
 - 3A. Structure of DNA
 - 3B. Secondary structure of proteins
 - 3C. Digestion of starch
 - 3D. Reactions of β - oxidation of palmitic acid in mitochondria
(4×4 = 16 marks)
4. **Answer the following:**
 - 4A. Give two functions of dietary fibers.
 - 4B. Name two important products each derived from tyrosine and glycine.
 - 4C. List four functions of calcium.
 - 4D. Write the normal serum levels of total protein, uric acid, creatinine and total cholesterol.
 - 4E. What are proenzymes? Give two examples.
(2×5 = 10 marks)



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FIRST YEAR B.Sc. N.M.T. DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: COMPUTERS AND MATHEMATICS

Tuesday, June 04, 2013

Time: 10.00-13.00 Hrs.

Max. Marks: 80

✍ Answer SECTION – A and SECTION – B in two separate answer books.

SECTION – A: COMPUTERS: 40 MARKS

1. Answer all the questions.

1A. Write a short note on Quality Assurance and care of computers.

1B. Write on the following:

a) Digitization b) Seek time

1C. What are computers? Classify them and give its application in Nuclear Medicine.

1D. What is Cache Memory?

1E. Write short note on CPU.

1F. Write short note on Image Algebra with its applications.

1G. What matrix size would you choose for a Renogram if the system resolution and field of view of the gamma camera is 25mm and 38cms respectively?

1H. Write short note on pixel depth.

(5×8 = 40 marks)

SECTION – B: MATHEMATICS: 40 MARKS

✍ Answer any EIGHT questions of the following:

2A. Show that $(\tan \theta + \cot \theta)^2 = \sec^2 \theta + \operatorname{cosec}^2 \theta$

2B. Find the value of x and y by solving simultaneous equation:

$$2x - 3y + 7 = 0 \text{ and } 5x + 2y + 8 = 0$$

(2+3 = 5 marks)

3A. Find the angle of intersection of $y = x^3$; $6y = 7 - x^2$ at the point (1,1).

3B. For a given function $f(x) = 1 - 3x$, find all ϕ between (1, 4) satisfying Lagrange's Mean Value Theorem.

(2+3 = 5 marks)

4A. Define one-one function, onto function, even function and odd function.

4B. Differentiate: $\frac{x \log x}{x-1}$ w.r.to x

(2+3 = 5 marks)

5A. Find $\lim_{x \rightarrow a} \frac{x-a}{\sqrt{x^3} - \sqrt{a^3}}$

5B. Prove that: $\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta} = \tan \frac{\theta}{2}$

(2+3 = 5 marks)

6. 300mCi of Tc-99m was eluted at 9.00 a.m. 100mCi of Tc-99m were used for scans immediately. Find the activity remaining of Tc-99m at 4.30 p.m on the same day. ($t_{1/2} = 6$ hrs)
(5 marks)

7A. Let $A = \{2,4,5, 6, 8, 9\}$, $B = \{1,2,6,7,8\}$ Find $A \cap B$, $A \cup B$ and draw Venn diagram.

7B. Evaluate $\int_0^{\pi/2} \sin^2 x \, dx$.

(2+3 = 5 marks)

8A. Explain log-log graph.

8B. Prove that: $\log_4 2 + \log_8 2 + \log_{16} 2 = 13/12$

(2+3 = 5 marks)

9A. Find x: $\log_x 16 + \log_x 4 = 6$

9B. Evaluate: $\int (x^2 - 2x + 5)^5 (x - 1) \, dx$

(2+3 = 5 marks)

10A. Show that $(\tan \theta + \cot \theta)^2 = \sec^2 \theta + \operatorname{cosec}^2 \theta$

10B. Form differential equation by eliminating the arbitrary constant 'a': $ay^2 = x^3$.

(2+3 = 5 marks)

